Amendments to the Specification

Please add the following new heading before paragraph [0001]:

BACKGROUND

Please add the following new heading before paragraph [0014]:

SUMMARY OF THE INVENTION

Please delete paragraph [0015].

Please replace paragraph [0016] with the following amended paragraph:

[0016] In accordance with ~~the~~ one method according to the invention ~~as claimed in claim 1~~, the computerized design model of the system comprises a number of surfaces. Each of these surfaces belongs to a body of the system. For example, the surfaces are surfaces of the bodies or surfaces that approximate the respective bodies. In the case of thin sheets as bodies, the approximating surfaces are preferably their middle surfaces. The design model does not necessarily comprise volumetric models of the bodies.

Please replace paragraph [0025] with the following amended paragraph:

[0025] The decision criterion that may be ~~is~~ applied ~~in accordance with claim 1~~ to determine connectable element pairs is a computerized, automatically evaluable criterion. It supplies the connectable surfaces or areas of surfaces substantially more quickly than an operative by manual stipulation. Consequently, the determination of connectable surfaces is objective and practicable and can be repeated as often as desired. There is no need to keep asking experienced designers or computing engineers for expert knowledge with each application. Subjective factors and errors or mistakes that frequently occur in the case of manual stipulation are excluded. There is, furthermore, no need to prescribe a stipulation as to which surfaces are to be neighboring or overlapping.

Please replace paragraph [0031] with the following amended paragraph:

[0031] The mechanical behavior of a layer can be predicted realistically only when the layer occurs as a spatial, that is to say three-dimensional, object, and not as a surface in the simulation.

Further finite elements are therefore preferably generated for the layer. In ~~accordance with claim 12~~ another refinement of the invention, the interspaces between the pairs of finite elements determined in accordance with the invention may be ~~are~~ automatically meshed. Finite elements with nodal points are thereby generated for these interspaces. This meshing need not necessarily depend on the meshing of the approximating surfaces. Consequently, the meshing of the layers can be effectively adapted to the respective tasks that are to be treated with the aid of the solution of the system of equations generated according to the invention. For example, depending on the tasks, the connecting layer is decomposed into many small or a few large further finite elements. The thickness of the connecting layer is taken into account even when the layer has different thicknesses at various points. The layer is treated in the system of equations by using continuum mechanics. For example, one body is a flat sheet, and another body is a V-shaped folded sheet. In accordance with the method according to the invention it is exclusively finite elements in one connectable limb of the V-shaped sheet, and finite elements in the adjoining part of the other sheet that are determined as connectable finite elements. Further finite elements are generated only in the interspace between the connectable limb and the opposite area of the flat sheet.

Please replace paragraph [0033] with the following amended paragraph:

[0033] ~~Claim 2~~ Another further refinement establishes ~~refinements as to~~ how the selection of element pairs ~~is~~ may be carried out quickly on the basis of their spacing. The selection that can be executed quickly is made ~~according to claim 2~~ with the aid of the nodal points of the two surfaces of a surface pair. Firstly, all the node pairs are determined that consist in each case of one nodal point of one surface and one nodal point of the other surface. If one surface comprises N_1 nodal points, and the other surface comprises N_2 nodal points, N_1 * N_2 nodal pairs are determined thereby. The spacing between the two nodal points of the node pair is determined for each node pair. A selection is made from among the N_1 * N_2 pairs of nodal points. Those node pairs whose two nodal points have a spacing that is smaller than or equal to a prescribed upper bound are selected.

Please replace paragraphs [0035] to [0042] with the following amended paragraphs:

[0035] ~~Claim 3 and claim 4 develop the refinement according to claim 2. An~~ In other refinements of the invention, an additional preselection from among the determined element pairs ~~is~~ may be carried out on the basis of the spacings of nodal points.

[0036] In ~~accordance with claim 3~~ another refinement of the invention, a check may be ~~is~~ made for each determined element pair as to whether each nodal point of one finite element of the element pair has a spacing from at least one nodal point of the other finite element that is smaller than or equal to a prescribed upper bound. If a nodal point of one finite element has too large a spacing from all the nodal points of the other finite element, the test is terminated and the element pair is not preselected and therefore not selected and subjected to further tests. Those previously determined element pairs are preselected for which the test supplies a positive result.

[0037] By contrast, in ~~accordance with claim 4~~in another refinement of the invention, a test may be ~~is~~ made for each determined element pair as to whether each nodal point of one finite element of the element pair has a spacing from all the nodal points of the other finite element that is smaller than or equal to a prescribed upper bound. If a nodal point of one finite element has too large a spacing from a nodal point of the other finite element, the test is terminated and the element pair is not preselected and therefore not selected and subjected to further tests. Those previously determined element pairs are preselected for which the test supplies a positive result.

[0038] ~~Claim 5~~ Another refinement of the invention provides that the spacing between two finite elements of an element pair may be ~~is~~ compared not only with the upper bound, but also with a prescribed lower one. The element pair is not selected if the spacing is smaller than the lower bound. A selection from among the element pairs is thereby already carried out on the basis of the spacing. Whenever the spacing is greater than an upper bound or smaller than a lower one, it is decided that the finite elements are not connectable.

[0039] ~~Claim 6~~ Another refinement establishes ~~refinements as to~~ how the selection of element pairs ~~is~~ may be carried out quickly on the basis of their spacing. Approximations for the spacing are determined thereby with the aid of various sequences, and compared with upper and/or lower bounds. At least one of these sequences is preferably executed when determining spacing. It is also possible to carry out a number of sequences and to compare the respectively determined spacing with an upper and/or lower bound in each case. If all the sequences and comparisons lead to a positive result, further tests are carried out in order to decide that the two finite elements are connectable. If a comparison leads to a negative result at the end of a sequence, it is decided that the two finite elements are not connectable.

[0040] ~~The~~ Another refinement ~~according to Claim 7~~ lays down a range of further tests which may feature in the decision criterion that can be evaluated by computer. At least one of these tests is carried out when taking the decision concerning whether the finite elements of a selected element pair are connectable or not. The decision criterion preferably applies a logical combination of the results of these tests. For example, finite elements of a pair are classified as connectable whenever all the tests, or whenever at least a single test are/is fulfilled. The individual tests are preferably carried out in a prescribed sequence such that the individual tests with the lowest computational outlay are carried out first. The carrying out of the individual tests is terminated for an element pair when it has already been established on the basis of the individual tests already carried out whether the finite elements of the pair are connectable or not.

[0041] At least one of the following individual tests is carried out in accordance with ~~claim 7~~ this refinement:

- Do the finite elements belong to surfaces of different bodies? Specifically, it is possible that the two finite elements of an element pair belong to two different surfaces of the same body and are connectable.

- The angle between the two finite elements of the element pair is determined, for example as an angle between two normals to the finite elements. A test is made as to whether the angle is smaller than or equal to an upper bound - the test then delivering a positive result - or not.

- One finite element of the element pair is projected along a projection vector. This projection vector is generated, for example by generating two normals of the same length on the two finite elements, and the projection vector is the sum vector of these two ~~(claim 8)~~. It is tested whether the projected finite element overlaps the other finite element - the test then supplying a positive result - or not.

- The midpoints of the two finite elements of the element pair are determined. One finite element of the element pair is projected along a projection vector. The spacing between the midpoint of the projected finite element and the midpoint of the other finite element is determined. A test is made as to whether this spacing is smaller than or equal to an upper bound - the test then supplying a positive result - or not.

- As just described, the spacing between the midpoint of the projected finite element and the midpoint of the other finite element is determined. The length of the longest edge of the two finite elements of the pair is determined. The quotient of the spacing and the longest edge length is calculated. A test is made as to whether the quotient is smaller than or equal to an upper bound - the test then supplying a positive result - or not.

[0042] In accordance with ~~claim 9~~ a further refinement, at least one bound may depend ~~depends~~ on at least one of the following parameters:

- a technical parameter of the prescribed joining technology,
- the nature of a surface of a body,
- the material provided for producing a body,
- a stipulation valid for all the bodies of the system.

Please replace paragraphs [0044] and [0045] with the following amended paragraphs:

[0044] In accordance with ~~claim 10~~ another possible refinement, the term joining technology covers many possible technologies, for example bonding, welding or else that of a sealing or insulating or spacing layer. For example, a spacing layer made from rubber is inserted in order to observe a prescribed minimum spacing between various parts of the bodywork, for example planking and inner parts of a motor vehicle.

[0045] ~~The~~ Another possible refinement ~~according to claim 11~~ takes into account the possibility of various joining technologies coming into consideration for connecting boundary surfaces. These various joining technologies respectively have an evaluation that depends, for example, on the costs and/or the reliability of the respective technology. For each pair of boundary surfaces, the joining technologies that can be applied for connecting this pair are determined. It is possible that not a single, or only one, joining technology is determined. If, by contrast, a number are determined, one is selected with the aid of the evaluations. It is possible for different joining technologies to be selected thereby for one system.

Please replace paragraph [0047] with the following amended paragraph:

[0047] ~~Claim 16~~ Another possibility provides an advantageous refinement of how these dependencies are taken into account in that for a set of nodal points of further finite elements in the interspaces, there are respectively determined a closest surface of the design model, a closest finite element of this surface, and a closest point on this finite element, and equations for

physical relationships between the values that the physical quantity assumes in the set of nodal points, and the values that the physical quantity at the closest points, determined for the set, of the surfaces is generated and used when setting up the system of equations. ~~Claim 17~~ Another possible refinement exhibits a further refinement that spares nodal points and which thereby reduces the number of unknowns in the system of equations to be solved.

Please add the following new heading before paragraph [0048]:

BRIEF DESCRIPTION OF THE DRAWINGS

Please add the following new heading before paragraph [0063]:

DETAILED DESCRIPTION

Please amend the heading on top of page 29 with the following amended heading:

~~Patent claims~~ WHAT IS CLAIMED IS: